

SVKM's NMIMS University

Mukesh Patel School of Technology Management & Engineering

B. Tech. (All Branches)		Trimester I	
Sub: Applied Mathematics - I		Code : AM-I	
Periods per week	Lecture	4	
	Practical	-	
	Tutorial	2 Hrs.	
		Hours	Marks
Evaluation system	Theory Examination	3	50 (100 scaled down to 50)
	Test	-	20
	Term work		30
Objective	To provide an understanding of the basic concept of Applied Mathematics at post secondary level		
Prerequisite	Knowledge of HSC level mathematics		
Detailed syllabus			
Unit	Topics	Duration (Hrs)	
1	Applications of Derivatives : Curve Sketching; maxima and minima; increasing and decreasing functions; concavity and points of inflection; asymptotes; and symmetry; related rates; mean value theorems; Taylor's formula; Maclaurin series; l'Hospital's rule; linear and quadratic approximations; arc-length in Cartesian coordinates.	10	
2	Partial Derivatives : Level curves and level surfaces; chain rule; homogeneous functions in 2 or 3 variables; Euler's theorem; examples linear approximations and bounds on the error; gradient, directional derivative, tangent plane and normal line to a level surface.	10	
3	Lagrange Multiplier Method : Maxima and minima in 2 variables; constrained maxima with one or two constraints; least squares method for fitting a straight line or a parabola.	10	
4	Vectors : Scalar and vector triple products; equation of a line and a plane; angle between 2 planes; distance of a point from a line or plane; plane determined by 2 lines.	10	
	Total	40	

Note : Proofs of theorems are not expected.

Reference books:

1. Advanced Engineering Mathematics; Erwin Kreyszig, Wiley Eastern Limited.
2. Calculus and Analytic Geometry; G. B. Thomas and R. L. Finney, Narosa Publishing House.

Internet references: Nil

Tests & Term work:

At least 2 written test shall be given during the trimester.

At least 20 Problems to be solved in tutorial classes as given by the faculty.

SVKM's NMIMS University

Mukesh Patel School of Technology Management & Engineering

B.TECH (ALL BRANCHES)

FIRST YEAR- TRIMESTER I

SUBJECT : APPLIED SCIENCE I

SECTION II - APPLIED CHEMISTRY-I

LECTURES/WEEK : 2 HRS,

PRACTICALS/TWO WEEKS : 2 HRS

EXAMINATIONS : THEORY : 50 MARKS(SCALED DOWN TO 25)

T/W : 15 MARKS, TEST 10 MARKS

DETAILED SYLLABUS :

UNIT I : WATER & ITS TREATMENT :

(8 HRS.)

Impurities in Natural Water, Hardness of Water, Causes of Hardness, Disadvantages of Hard Water for domestic and industrial purposes & in Boilers -Scales and sludge formation in boilers, Caustic Embrittlement, Boiler Corrosion, Priming and foaming, Chemical analysis of Water – Chloride content , alkalinity , hardness ,sulphate , and silica content.

Internal and external Treatment of boiler feed water-

(a) Internal Conditioning Methods,

(b) Softening methods-Hot and Cold Lime-Soda .Method, Zeolite- Permutit Method, Ion-Exchange Method,

Numericals based on chemical analysis of water , Lime Soda Method and Zeolite and .Permutit Method

UNIT I : POLYMERS :

(7 HRS)

Introduction, definitions of important terms – monomer, polymer, polymerization, degree of polymerization, tacticity, glass transition temperature, molecular weight of polymers.

Classification of polymers Mechanism of Polymerisation - Compounding of plastics, Fabrication of plastics, Applications of plastics as engineering materials. Commercial polymers-synthesis, properties and applications of PF,UF,Polyurethanes.

Elastomers : Natural rubber, crepe and smoked rubber, drawbacks of natural rubber, Vulcanisation of rubber. Synthetic rubbers , compounding and applications of rubber , Commercial elastomers- synthesis, properties and applications of Buna-S, GR-S, Isocyanate rubber.

Numericals based on Molecular weight determination of polymers.

UNIT II : LUBRICANTS :

(4 HRS)

Introduction, classification of lubricants-solid, liquid semisolid lubricants, properties of ideal lubricants.

Mechanism of lubrication-Fluid film, Thin film, Extreme Pressure-Temperature lubrication.

Testing of lubricants, - viscosity, viscosity index, Flash and Fire point, Cloud and pour point, Acidity, Saponification value, volatility, oxidation stability, carbon residue, Selection of lubricants

UNIT III ; REFRACTORIES & GLASSES:

(3 HRS)

Refractories : Introduction, classification of refractories-acidic, basic, neutral, properties of ideal refractories, manufacture with flow sheet for common refractory bricks, cermets, insulating refractory bricks

Glasses : Introduction, manufacture of glass, Types of glasses –their composition, properties and applications.

TERMWORK : T/W should consists of following

- 1) Four assignments,
- 2) One class test
- 3) Minimum Five experiments out of :
 - a) To study effect of temperature on viscosity of lubricating oil using Redwood Viscometer
 - b) Determination of flash point of lubricating oil.
 - c) Determination of saponification number.
 - d) Determination of acid number (FFA)
 - e) Determination of mol. Wt. of a polymer using Ostwalds' viscometer.
 - f) Estimation of Chlorine content of water by Mohr's method.
 - g) Determination of acidity and alkalinity of water
 - h) Determination of dissolved oxygen in the water sample
 - i) Estimation of Total Hardness of water by EDTA method.

Books Recommended :

1. Engineering Chemistry , Jain and Jain Dhanpat Rai Publishing Company).
2. Fundamentals of Engineering Chemistry - Theory and Practice S.K.Singh, New Age International Publishers.
3. Applied Science – I , Dr. (Mrs.) J.A.Parikh and Dr. I.A.Shaikh, Nandu publishers and printers PVT. Ltd.
4. Engineering Materials, Venneth G. Budinski , Prentice-Hall (I) publications.
5. Polymer Science , V.R.Gowariker , Wiley Eastern Ltd.

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SVKM's NMIMS University

Mukesh Patel School of Technology Management & Engineering

B.Tech. (All Branches)

Trimester – I

Subject- Applied Science– I

Section- I Applied Physics - I

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Lectures : 2 Hrs./week

Theory Exam : 50 marks(scale down to 25)

Practicals : 2 Hrs/week

Term Work 15 Marks, Test 10 marks

Objective: To develop understanding of the fundamentals of the subject and develop the ability to use it for various Engineering applications. To expose the students to relevant topics in the subject of Physics.

1) Solid State Physics:

(a) (a) Crystal Structure: Structure of cubic crystals, special form in cubic crystals, diamond structure, Miller indices, planes and direction, legancy and critical radius ratio in ionic crystal. Imperfections: point, line, surface & volume (Introductory). (6 hrs.)

(b) (b) Formation of energy bands and classification of solids, conductors, semiconductors, insulators. Physics of semiconductor junction. Fermi levels in semiconductor, energy gap and its temperature dependence. (3 hrs.)

(2) Electricity and Magnetism:

Motion of charges in electric field and magnetic field. Vertical deflection due to Electric and Magnetic field. Application of electric and magnetic field to determine e/m and cyclotron. Electrostatic focusing system, C.R.O. (concept, theory) and uses. (6 hrs.)

(3) Thermo-electricity:

Seeback effect, Peltier effect, Thomson effect, thermo-electric power, law of successive temperature, law of intermediate metals, application of thermodynamics on thermocouple. Thermopile. (3 hrs.)

(4) Quantum Physics and Applications

Review of Particle Nature: Particle Nature of Light, Photo electric effect, Compton effect, wave packets, phase and group velocity, Davison Germer experiment, Heisenberg Uncertainty Principle.

(5 hrs.)

Term Work:

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|---|----|
| (A) (1) Report on experiments performed (at least 5) based on syllabus. | |
| (2) Assignment consisting of numerical problems (at least 10) marks | 15 |
| (B) Two Written Test during the term - marks | 10 |

Recommended Books:

- (1) Concept of Modern Physics – Arthur Beiser TMH
 - (2) Engineering Physics – R.K. Gaur and S.L. Gupta, S. Chand co.
 - (3) Engineering Physics – A.S. Vasudeva
 - (4) Nuclear Physics - Cohen
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Mukesh Patel School of Technology Management & Engineering

B.Tech.(All Branches)

ENGINEERING DRAWING

Instruction : Lecture : 2Hrs.
: Practical : 5Hrs.

Evaluation : Practical Examination 2 Hrs. : 50 Marks
: Term Work : 30 Marks Test 20 Marks

Objective : To develop skill in reading and understanding of drawings used in engineering applications. Students are expected to be conversant with the use of the code of practice used in engineering drawing. This will develop proficiency in the use of drawing as a medium of communication and as a document among designer, manufacturer and end user.

	Detailed Syllabus	Duration
1	Introduction <ul style="list-style-type: none">Drawing instruments, types of lines, dimensioning systems, geometrical constructions of templates.Engineering curves: - Conics	2hrs
2	Projection of lines (only first quadrant):- <ul style="list-style-type: none">Inclined to both the reference planes (problems based on horizontal trace (HT), vertical trace (VT), assumptions and applications are to be excluded)	1hrs
3	Projection of planes (only first quadrant):- <ul style="list-style-type: none">Inclined to both the reference planes.	1hrs
3	Projection of right regular solids(only first quadrant):- <ul style="list-style-type: none">(Cylinder, prism, pyramid and cone) inclined to both HP and VP.	2hrs
4	Sections & development of lateral surface of solids:- <ul style="list-style-type: none">Resting with axis perpendicular to one reference plane and cut by cutting plane perpendicular to at least one reference plane (excluding curved cutting planes, intersection and reverse development)	3hrs
5	Orthographic projections:- <ul style="list-style-type: none">Multi view orthographic projection of various objects/machine parts by first angle and third angle method of projections. sectional views are to be included	3hrs
6	Missing views:- <ul style="list-style-type: none">Reading and interpretation of orthographic projection (missing views) by first angle and third angle methods of projections.	3hrs
7	Isometric views:- <ul style="list-style-type: none">Isometric views using isometric scale or true scale of simple components (excluding spheres)	3hrs

8	Free hand sketches:- <ul style="list-style-type: none"> • Thread profile, IS convention of external and internal threads, drilled, blind and tapped holes. • Bolts: - Hexagonal, square and cylindrical heads. • Nuts: - Hexagonal, square, wings and capstan. • Set screws. 	1hrs
9	Introduction to computer 2-D drawing <ul style="list-style-type: none"> • Preparation of three views of 2-D drawing using computer aided drawing 	2hrs
Term work :		Hrs
Term work shall consist of the following (All drawings to be prepared on half imperial drawing sheets)		
1. One drawing sheet on reconstruction of templates and drawing of conics.		5
2. One drawing sheet on orthographic problems in including sectional views.		5
3. One drawing sheet on projection of lines and projection of solids.		5
4. One drawing sheet on sections of solids and development of it.		5
5. One drawing sheet on isometric projection.		5
6. One drawing sheet on missing views.		5
7. Computer aided 2D drawing of at least two components (print outs)		10
Each student is to appear for at least one written test during the term.		

Reference books: - Engineering drawing by N D. BHATT
Engineering drawing by P J. SHAH
Engineering drawing by N H. DUBEY

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B.Tech. IT, Computer, Electronics, Telecommunication.		Trimester : I	
Sub: Computer Programming – I		Code : CP-I	
Periods per week	Lecture	4 hrs.	
	Practical	2 hr	
	Tutorial	-	
		Hours	Marks
Evaluation system	Theory Examination	3	100 (scaled down to 50)
	Test	--	20
	Term work	--	30
Detailed Syllabus			
Unit	Topics		
1.	Introduction to Linux & C Programming Language		---- [04 hrs]
	1.1 Brief History of 'C' 1.2 Program Development Life Cycle 1.3 Getting Started with Linux 1.4 Linux File System 1.5 Basic Linux Commands		
2.	The Components of a C Program		---- [05 hrs]
	2.1 Program's Components 2.2 Variables 2.3 Numeric Data Types 2.4 Constants 2.5 Statements, Expressions and Operators		
3.	Functions : The Basic Control		---- [06 hrs]
	3.1 Function Defined 3.2 How a Function Works 3.3 Functions & Structured Programming 3.4 Writing a Function 3.5 Passing Arguments to a Function 3.6 Calling Functions, Recursion		
4.	Basic Program Control		---- [05 hrs]
	4.1 Arrays 4.2 Controlling Program Execution : For, While, Do..While, Nested Loops		
5.	Fundamentals of I/O		---- [02 hrs]
	5.1 Displaying Information OnScreen : printf(), puts 5.2 Inputting Data : scanf(), gets		
6.	Understanding Pointers		---- [06 hrs]
	6.1 What is a Pointer? 6.2 Pointers and Simple Variables 6.3 Pointers and arrays 6.4 Passing Arrays to Functions 6.5 Passing Pointers to Functions		

7.	Characters & Strings 7.1 Using character Variables 7.2 Using Strings 7.3 Strings and Pointers 7.4 String without Arrays 7.5 Displaying and Reading Strings	---- [06 hrs]
8.	Structures 8.1 Simple Structures 8.2 Complex Structures : containing arrays, structures 8.3 Arrays of Structures 8.4 Structures & Pointers 8.5 Unions	---- [06 hrs]

Books Recommended for Reading and Reference

Main Reading

1. *Ashok N. Kamthane*, "Programming With ANSI C", Pearson
2. *Ramkumar and Rakesh Agarwal*, "Programming With ANSI C", Tata McGraw Hill
3. *Yashwant Kanetkar*, "Let us C", BPB

Supplementary Reading

1. *Narayanaswamy Kutti*, "C and Unix Programming", Tata McGraw Hill

Internet references: as given by the faculty

Term work: Term work consist of the following

1. **Minimum 10 practical experiments covering all the topics.**
2. **Two term test papers.**
3. **Minimum two assignments.**

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B.Tech. IT, Computer, Electronics, Telecommunication.		Trimester I	
Sub: BASIC ELECTRICAL ENGINEERING		Code : BEE	
Periods per week	Lecture	4 hrs.	
	Practical	2 Hrs	
	Tutorial	-	
		Hours	Marks
Evaluation system	Theory Examination	3	50 (100 scaled down to 50)
	Test		20
	Term work		30
Objective			
At the completion of this course, student becomes familiar to fundamentals of electrical engineering. Machines and transformers form the major component of electrical engineering discipline and understanding their principles and technicality is the prime objective of this course. No enterprise engaged in any activity do away with machines, motors and transformers either as tools.			
Prerequisite		Knowledge of HSC level Physics.	
Detailed syllabus			
Unit	Topics	Duration (Hr)	
1	Units of work, power and energy. Effect of temperature on resistance. Series parallel circuits.	4	
2	Concept of linear & nonlinear circuit. Kirchoff's law, Superposition theorem, Thevenin's theorem & Norton's theorem. Max Power Transfer theorem	10	
3	DC Transients : R-L & R-C transients, time constant, expression for energy stored for inductance & capacitance.	4	
4	AC Fundamentals : Alternating quantities, RMS & Avg values, form factor, frequency, crest factor, series combination of R-L, R-C & R,L,C (with resonance) & parallel circuits (with resonance). Three phase circuit. Concept of balanced & unbalanced tools. Expression for total power, KW, KVAR & KVA.	13	
5	Single phase transformer, emf equation, determination of efficiency & regulation by direct loading.	4	
6	Basic principles of measurement of electrical quantities voltmeter, ammeter, wattmeter, energy meter.	4	

7	DC & AC Machines: Working principles, speed control. Three phase induction motor, single phase motor, working, applications of motors.	5
	Total	44

Books:

Reference books:

1. Electrical Engineering Fundamentals; Vincent Del Toro, Prentice Hall Pvt. Ltd.
2. Electrical Technology "Cotton"; Wheeler Pub.
3. Electrical Technology; B. L. Theraja
4. **A course in Electrical & Electronics Measurement & Instrumentation;**
A. K. Shawney, Dhampat Rai & Sons.
5. **Basic Electrical Engineering; V. N. Mittle; Tata McGraw Hill.**

Internet references: www.electriccircuit.com

Test & Term work:

The term work shall comprise of at least six laboratory experiments and assignments based on the whole syllabus, duly recorded and graded.

Minimum two class tests.

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